

W. H. ELLIOT.
SPRING-EQUALIZER.

No. 175,595.

Patented April 4, 1876.

Fig. 1.

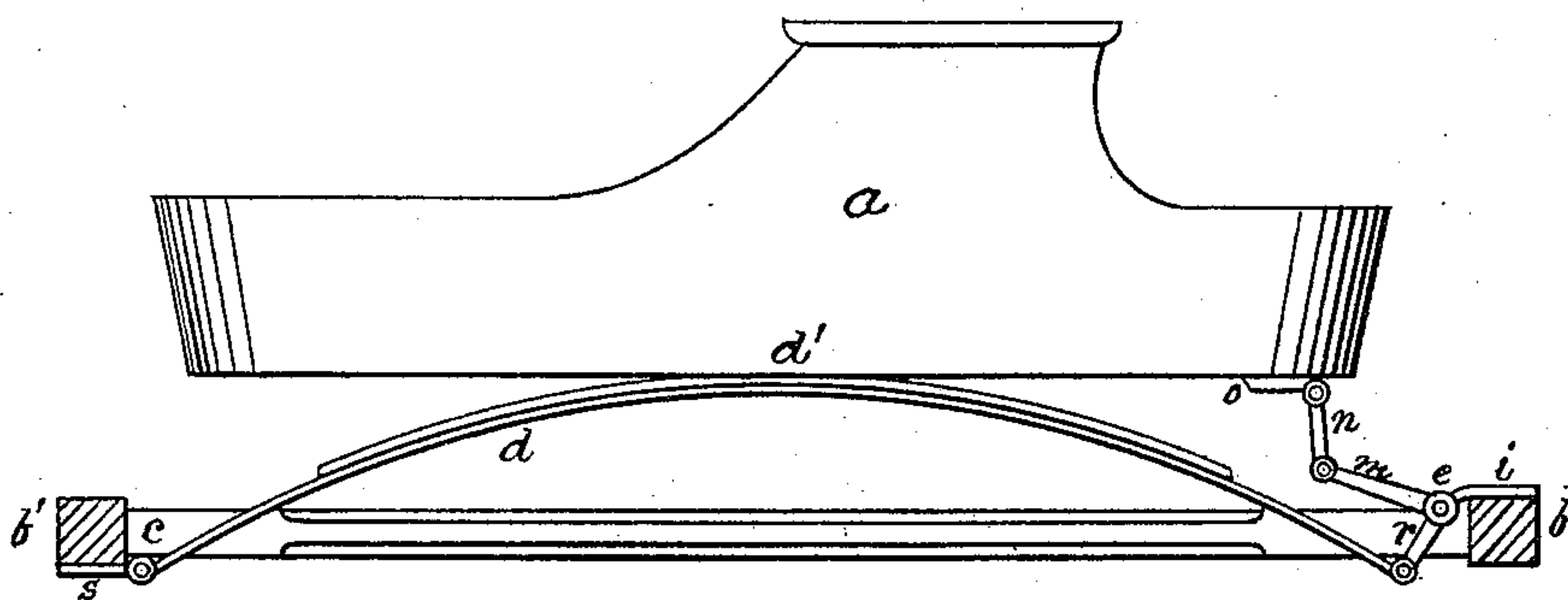


Fig. 2.

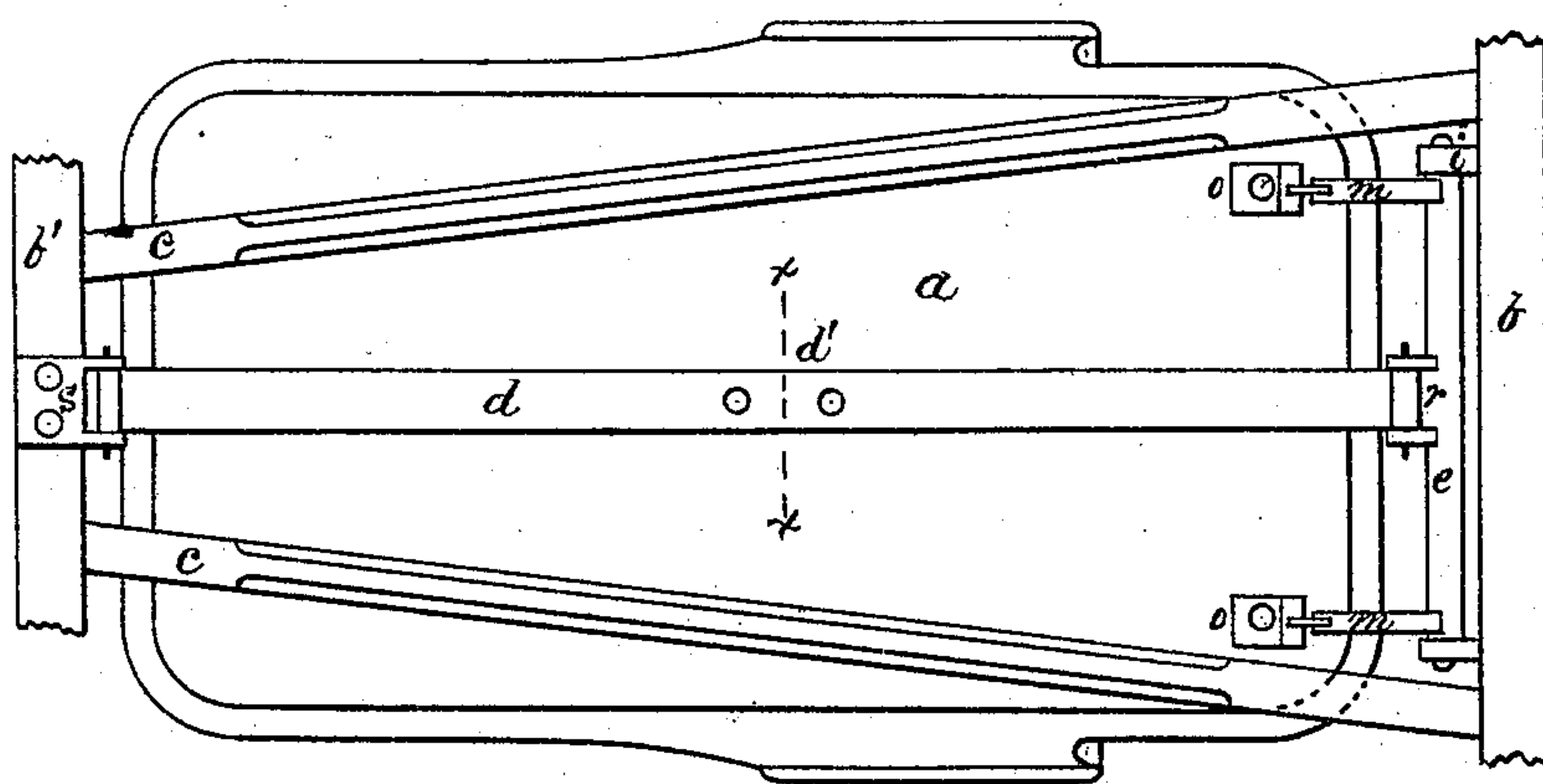
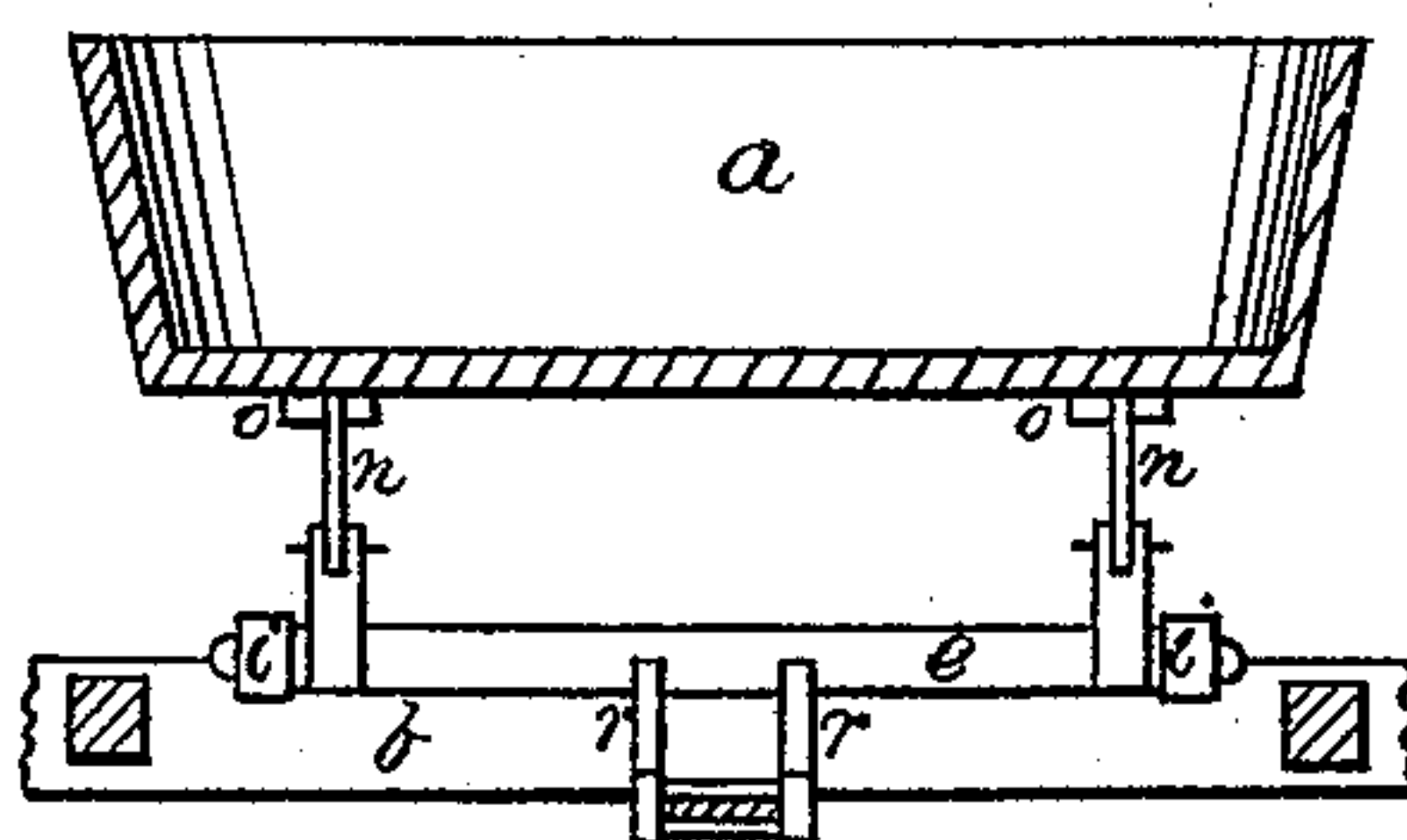


Fig. 3.



Witnesses.

D. Lewis
Louis E. Moore

Inventor.

W. H. Elliot

UNITED STATES PATENT OFFICE.

WILLIAM H. ELLIOT, OF NEW YORK, N. Y.

IMPROVEMENT IN SPRING-EQUALIZERS.

Specification forming part of Letters Patent No. **175,595**, dated April 4, 1876; application filed February 7, 1876.

To all whom it may concern:

Be it known that I, WM. H. ELLIOT, of the city, county, and State of New York, have invented a new and Improved Carriage-Spring; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Similar letters of reference indicate the same devices in all the figures.

To enable others skilled in the arts to comprehend, make, and use my invention, I will proceed to describe its nature, construction, and operation.

The nature of my invention consists in the employment of an equalizer in such combination with a carriage-body and one or more side or reach springs that a load placed upon any part of the body shall not depress it unequally, as will be hereinafter explained and claimed.

Figure 1 of the drawing represents a side elevation of a buggy provided with a reach-spring and an equalizer, showing the rear axle and bolster in section. Fig. 2 is a plan view of the same. Fig. 3 is a vertical transverse sectional view of the same, looking toward the rear.

a is the carriage-body; *b*, the rear axle; *b'*, the bolster; *c*, the reaches connecting the same. *d* is an elliptical leaf-spring, which I term a reach-spring, because, like the reaches, it connects the rear axle with the bolster. This spring is secured to the body at *d'*; *e*, the rock-shaft, composed of any suitable material, having its bearings in brackets *i*, which are secured to the axle. This shaft is provided with rigid arms *m*, one at or near each end. The ends of the arms are connected with the carriage-body by means of rods or links *n*, said links being pivoted to studs *o* at their upper ends. The studs are secured to the under side of the carriage-body. The rock-shaft *e*, arms *m*, and links *n* form an equalizer, which holds the carriage-body level against unequal loading at the sides. The rock-shaft also has upon it rigid arms *r*, arranged at, or nearly at, right angles to arms *m*, for the support of the rear end of the reach-spring. When a central reach-spring is used a pair of these arms *r* are placed at the center of the rock-shaft; but when two reach-springs are used, one at

each side, a pair of the arms *r* are placed at or near each end of the rock-shaft. To the extremity of the arms *r* the spring *d* is pivoted at its rear end, the forward end of said spring being pivoted to a strap, *s*, which in turn is secured to the bolster. A short stirrup might be used here, which would make the action of the equalizer less positive, allowing the body to have a little rock fore and aft.

The object and effect of my peculiar combination of devices are as follows: When a load is thrown upon the forward end of the carriage-body the reach-spring is depressed, and therefore elongated. The forward end of the spring being pivoted at a fixed point, its elongation necessarily rolls the rock-shaft in its bearings, through the operation of the spring upon arms *r*, carrying the lower end of these arms backward and the forward ends of the arms *m* downward, bringing down with them the rear end of the carriage-body. When a load is thrown upon the rear end of the carriage-body the arms *m* are depressed by links *n*, causing the lower ends of arms *r* to swing backward, which depresses or drags down the springs, and brings down with them the forward end of the carriage-body, so that whether loaded at the front or rear end the result of my combination is to keep the body level.

The spring, instead of being bolted rigidly to the body at *d'*, may have a limited motion in a vertical plane upon axis *x*. This would give the spring greater freedom of action.

By the depression of an ordinary reach-spring at the center four inches, it will be elongated about one-inch and three-fourths, and to produce a perfect result the arms *r* should bear in the same proportion to the arms *m* in length that the elongation bears to the depression, as above stated.

By this arrangement of parts I have an equalizer which not only holds the body of the carriage level against loading the sides unequally, as hereinbefore stated, and as shown in my patent of the 11th of September, 1875, but it also holds it level against loading the ends unequally. The arms *m* and *r* form a lever whose fulcrum is in the axis of the rock-shaft, which is supported upon the running-gear, the carriage-body, and the springs, and at one end are connected together by this le-

ver, and through it the body and springs act upon each other, each alternately becoming power or weight as the load is changed from one end of the body to the other.

As the radial movement of the link *n* is very slight, this device and the stud *o* might be made in one elastic piece, and so avoid the noise of a joint between them.

I prefer, and have shown, one spring, for the reason that when one centrally-arranged spring is employed in connection with an equalizer, this latter device is not subject to the severe strains that are liable to fall upon it when used with two side reach-springs, as fully set forth in my before-mentioned patent.

The operation of my combination of devices is the same whether one or more springs are used; and I make my claim without reference to the number of springs employed.

Having described my invention, what I claim, and desire to have secured to me by Letters Patent of the United States, is—

1. The reach-spring *d*, secured to the carriage-body at *d'*, pivoted at a fixed point to the running-gear at one end, and connected with the carriage-body and the running-gear at the other end, and through the lever *m*, *r* and links *n*, whereby the spring and body operate upon each other, substantially as herein described.

2. The equalizer *e m n*, supported upon the running-gear in suitable bearings, in combination with the carriage-body and a reach-spring, which is pivoted at a fixed point to the running-gear at one end, and supported at the other end upon the equalizer by means of rigid arms *r*, whereby the movements of the sides and ends of the body are equalized, substantially as specified.

WM. H. ELLIOT.

Witnesses:

D. LEWIS,
LOUIS E. MOORE.